REMARKS:

Upon entry of the present amendment, claims 1, 2, 4-7, 9-12, and 14-24 are pending in the application, of which, claims 1, 2, 6, 7, 11, 12, and 16 are independent.

The above-identified Office Action has been reviewed, the references carefully considered, and the Examiner's comments carefully weighed. In view thereof, the present amendment is submitted. It is contended that by the present amendment, all bases of rejection set forth in the Office Action have been traversed and overcome. Accordingly, reconsideration and withdrawal of the rejection of record are respectfully requested.

Amendments Presented

Applicant has amended independent claims 1-2, 6-7, and 11-12 to further define the claimed invention by incorporating limitations substantially corresponding to those in original claims 3, 8, and 13 (now canceled) which relate to formation / configuration of a Noise-Vocoded Speech Sound signal from an input sound signal and a noise which deteriorates the input sound signal, and by slightly modifying claim terms to more particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant has amended claims 18-21 to further define the input signal as containing ambient noise, where the input signal is subject to a sound signal extractor and then to the first band filtering portion. New claims 22-24 further define that the Noise-Vocoded Speech Sound signal is adapted to be recognized by utilizing a healthy brain part of a hearing-impaired person such that a part of recognizable sound information may be compernsated by a part of the person's brain other than the healthy part, so that the input sound signal may be understood by the hearing-impaired person.

The specification is amended to overcome some minor informalities.

Applicant respectfully submits that the above amendments are fully supported by the

original application, including the drawings. For example, an input sound signal including an ambient noise is supported by the discussion of Embodiment 8 on page 16, and the defined nature of the Noise-Vocoded Speech Sound signal is supported at the paragraph bridging pages 2-3 of the original specification. Applicant also respectfully submits that the above amendments do not introduce any new matter into the application.

Incidentally, applicant notes that the priority Japanese Application 2002-297635 has *been issued as Japanese Patent No. 3973530*, and a copy of the claims allowed in the patent are attached hereto. Some of the allowed claims in Japanese Patent No. 3973530 substantially correspond to claims 22-24 added in the present Amendment.

Claim Objection:

The Examiner objected to claim 12 because of a minor informality. Applicant has amended claim 14 with an appropriate correction and therefore, requests reconsideration and withdrawal of the Examiner's objection.

Double Patenting Rejection:

The Examiner rejected claims 1-2 on the ground of provisional, nonstatutory obviousness-type double patenting as unpatentable over claims 1-2 of co-pending Application No. 10/583,717 (Pub. No. 2007/0185710). The Examiner asserted that although not identical, the two devices are not patentably distinct in that they use the same technique in providing a Noise-Vocoded Speech signal, differing only in the intended use. Similarly, the Examiner rejected claims 1-2, again, on the same ground, as unpatentable over claims 1, 2, 11, and 12 of another co-pending Application No. 11/411,758 (Pub. No. 20070009864), while the Examiner also rejected claims 6, 7, 11, and 12 on the ground of double patenting, as unpatentable over claims 1 and 2 of yet another co-pending Application No. 10/538,480 (Pub No. 20060167681).

Incidentally, it is noted that the three co-pending applications have issued as patents subsequent to July 9, 2008, the date of the Office Action, such that the rejections are no longer "provisional".

Applicant's Response:

Upon careful consideration and in light of the above amendments to the present claims 1, 2, 6, 7, 11, and 12, applicant respectfully submits that these claims are patentably distinct over the claims in the cited co-pending applications, based on the following.

Initially, applicant respectfully submits that present claims 6, 7, 11, 12 are patentably distinct over the claims of co-pending application 10/538,480 because the present claims pertain to a training device and a game device wherein answers of a trainee or game player are determined to be correct or incorrect, and the device merely outputs an indication of whether or not the answer is correct, whereas quite differently the claims of application 10/538,480 primarily involve diagnosis of a disease of a patient based on the patient's response.

Similarly, applicant respectfully submits that present claims 1, 2 are patentably distinct over the claims of co-pending applications 10/583,717 and 11/411,758 because the present claims pertain to a hearing aid which automatically configures / generates Noise-Vocoded Speech Sound signal and outputs the same when it receives input sound signals (such that the input sound signals may be understood by hearing impaired persons), whereas quite differently the claims of applications 10/583,717 and 11/411,758 primarily involve prevention of senility and foreign language learning.

Based on the foregoing, it is respectfully requested that the (provisional) nonstatutory obviousness-type double patenting rejections of claims 1, 2, 6, 7, 11, and 12 be reconsidered and withdrawn.

35 USC §103(a) Rejection:

(a) The Examiner rejected **claims 1-2, 6-7, 11-12, and 18-20** under §103(a) as being unpatentable over Wright et al. (US 6,109,107). (Office Action: pages 5-7). Specifically, the Examiner asserted that Wright generally discloses applicant's claimed invention except that Wright does not expressly disclose that the device is a hearing aid, a training device, and a gaming device (as claimed in claims 1-2, 6-7, 11-12, respectively), but that "Wright teaches a device for perception of transmitted sound" and that as such, it would have been obvious to utilize the Noise Vocoded Speech signal of Wright to improve a user's sound perception in a hearing aid and in a training device, as well as to improve the quality of gaming experience in a gaming device. Relative to claims 18-20 the Examiner asserts that Wright further discloses a sound signal extractor for extracting only a sound component from an input signal.

Applicant's Response:

Upon careful consideration and in light of the above amendments to the present claims 1, 2, 6, 7, 11, and 12, applicant respectfully submits that these claims are patentably distinct over Wright, because Wright actually does not disclose or pertain to Noise Vocoded Speech signals, and his learning remediation apparatus/method are *fundamentally distinct* from the invention now defined in the rejected claims.

As now defined, distinguishing characteristics of the present claims involve specific steps of "applying a nose source signal to a…", "multiplying an output from…" etc., whereby voice frequency components of an input sound signal are replaced with noise. In other words, the present invention teaches monotonous noise with amplitude change of voice (strong and weak). This amplitude change is constituted in the embodiment of Fig. 1, for example, by the envelopes extracted by the envelope extractors 2a, 2b, … . The input sound signal (voice) is filtered

through the band filter, extracted as the envelope, and then added with noise, which is filtered through band filter and multiplied before being output. Therefore, the main content of the voice signal (frequency component) is removed, with only the envelope remaining. The output sound is like a rusty voice, meaningless noise.

The hearing aid, training device, and game device of the present claims advantageously enable a (hearing-impaired) person's brain to be activated by trying to understand the words of the noise.

Quite differently from the present claims, Wright discloses masking (target) sound signal with various noise signals at the same time or at a little shifted time. Moreover, Wright's voice signal is merely overlapped with noise (Wright, col. 4, lines 22-24), and such voice signal is heard among various noise frequencies. Again, this is very different from the presently claimed invention in which a voice signal is synthesized from noise – that is, the claimed invention teaches monotonous noise with an amplitude-changed voice signal.

Applicant also submits that Wright does *not* disclose a device forming a "Noise-Vocoded Speech Sound" as claimed in the present application. As disclosed in the BACKGROUND ART section of the present application, such signal is obtained by specific sound signal filtering, amplifying, and multiplying of input sounds (such as speech). Wright discloses an audio device for diagnosing (primarily) and treating language impaired individuals, wherein the individual being diagnosed is presented with a *series of different target stimuli* in an effort to find problem(s) the individual may be suffering from. This is different from the present invention, which *does not involve any diagnosis* to determine different problems of individuals, and which alters input sounds in *the same manner every time* using Noise-Vocoded Speech Sound. Moreover, the specific target stimuli used by Wright, as broadly described at col. 3, lines 29-48,

is not related to Noise-Vocoded Speech Sound as discussed above and claimed in the present application, which involves modification of a sound signal through a specific combination of several actions.

Apart from the fact that Wright does not actually teach/use Noise-Vocoded Speech Sound, applicant respectfully traverses the Examiner's allegation/conclusion that it would have been obvious to a person of ordinary skill in the art at the time of the invention to use the Noise-Vocoded Speech Sound of Wright to improve a user's sound perception in a hearing aid or gaming device, because in the Examiner's view, Wright teaches apparatus for perception of transmitted sound. Wright's method and apparatus involving a series of target stimuli necessarily involve diagnosis of a particular individual using multiple different stimuli; therefore, it would make no sense to apply a series of different stimuli to a hearing aid or gaming device.

Likewise, regarding claims 18-20, applicant respectfully traverses the Examiner's rejection. Upon a careful consideration of the applied references, applicant notes that Wright states, "A target stimulus is the target of reception [and] *the sound signal component to be identified by the individual* under test." (Wright, col. 3, lines 29-48, as referred to by the Examiner). At best, Wright indicates what the target stimulus is and not how it is functionally or structurally obtained – Wright does *not* disclose "a sound signal extractor [(e.g., filter)] for extracting only a sound component from an input signal."

For all of the foregoing reasons, applicant respectfully submits that the claimed invention is not obviated under §103(a) and therefore, requests reconsideration and withdrawal of the Examiner's rejections.

(b) The Examiner rejected **claim 3**, **8**, and **13** as unpatentable over Wright (as discussed above) in view of applicant's allegedly admitted prior art (AAPA). Specifically, the Examiner asserted that

Wright discloses the claimed invention except a Noise-Vocoded Speech Sound signal in which a component of a sound source signal is subjected to noise generated (by the steps) as claimed in the present application, but that in his view, applicant's allegedly admitted prior art discloses such feature(s) (as shown on page 1, line 20 to page 2, line 7), and that as such, it would have been obvious to modify Wright in view of the allegedly admitted prior art to produce the claimed invention.

Applicant's Response:

Although these claims have been cancelled, applicant respectfully traverses the Examiner's rejection as it applies to amended claims 1, 2, 6, 7, 11, and 12. Specifically, applicant respectfully submits that the above deficiencies of Wright are not overcome by additional teachings of the AAPA.

In this regard, applicant submits that while Noise-Vocoded Speech Sound may have been known prior to the claimed invention, there is no apparent reason to use Noise-Vocoded Speech Sound in Wright's method/apparatus other than for impermissible hindsight of the present application. Under MPEP §2142, such hindsight must be avoided in order to reach a proper §103 obviousness determination.

Applicant again notes that Wright's method/apparatus is primarily based on *diagnosis of individuals' specific hearing problems using a series of different target stimuli*, whereas Noise-Vocoded Speech Sound involves modification of a *given (single) input sound* (such as speech) by specific sound signal filtering, amplifying, and multiplying to obtain a single output sound signal. Therefore, there is no apparent connection between the known Noise-Vocoded Speech Sound and Wright's (diagnostic) method, and it is respectfully submitted that persons skilled in

the art would not have found the Examiner's proposed modification to Wright to be obvious under 35 USC 103.

For the foregoing reasons, applicant respectfully submits that the Examiner has not established a prima facie case of obviousness for §103(a) and therefore, requests reconsideration and withdrawal of the Examiner's rejections.

(c) The Examiner rejected dependent **claims 4**, **5**, **9**, **10**, **14**, and **15** as unpatentable over Wright et al. in view of Sturner et al (US 5,303,327). Specifically, the Examiner asserted that Wright discloses the claimed invention except at least one of a number of frequency band filters for division into frequency band signals and a frequency of a frequency band boundary can be changed at least through language, but that in his view, such features are *well known* in the art. The Examiner further asserted that Sturner discloses the claimed sound output device, including a sound source signal subjected to noise generated (i.e., enhancing or reducing parts of the spectrum with a masking noise, col. 6, lines 38-47) and a frequency change through language (i.e., system accounts for regional dialects, col. 5, lines 48-67). The Examiner then took the position that it would have been obvious to modify Wright in view of Sturner to produce the claimed invention.

Applicant's Response:

Applicant respectfully traverses the Examiner's rejections for the reasons stated above relative to Wright (which are not overcome by any teaching/disclosure of Sturner), and because Wright and Sturner do not disclose or make obvious the claimed features of the dependent claims.

In this regard, applicant submits that while Sturner may disclose that its system accounts for regional dialects, such features are significantly different from those in the claimed invention. For example, Sturner does *not* disclose changing frequency band boundaries of band filters based on

automatic language recognition, but instead, generally discloses a data file which is updated based on collected data. Further, while Sturner may disclose that its system "should include appropriate filters" (Sturner, col. 6, lines 40-47; the only discussion of such features in Sturner), Sturner does *not* disclose that such band filters divide sound signal into optimal frequency band signals nor that a frequency of the frequency band boundary can be changed (i.e., selected or switched) through Sturner's data file, as claimed in the present application.

In essence, Sturner teaches a series of test engines to examine communication abilities of individuals. The test is automatically operated by the voice recognition device instead of manual operation. Quite differently, the present invention teaches that processing conditions of voice (border frequencies of band filters) are changed to be the optimum values automatically. From such actual disclosures, persons skilled in the art would find that the objects and embodiments of the present invention are totally different than those of Wright and Sturner, and correspondingly, such persons would not consider the claimed invention to be obvious based on any hypothetical combination of the actual teachings of Wright and Sturner.

For all of the foregoing reasons, applicant respectfully submits that the claimed invention is not obviated under §103(a) over Wright in view of Sturner and therefore, requests reconsideration and withdrawal of the Examiner's rejections.

(d) The Examiner rejected **claim 16**, **17**, and **21** as unpatentable over Sturner (as discussed above) in view of AAPA. Specifically, the Examiner asserted that Sturner discloses the claimed invention except a Noise-Vocoded Speech Sound signal generated as claimed in the present application, but that in his view, applicant's allegedly admitted prior art discloses such feature(s), and that as such, it would have been obvious to modify the device of Sturner in view of the allegedly admitted prior art to produce the claimed invention.

Applicant's Response:

Applicant respectfully traverses the Examiner's rejections for the reasons stated above relative to Wright, AAPA, and Sturner, and because none of the applied references disclose or make obvious the claimed features of the dependent claims. Therefore, applicant respectfully submits that the claimed invention is not obviated under §103(a) and therefore, requests reconsideration and withdrawal of the Examiner's rejections.

Other Matters

New claims 22-24 are believed to be allowable over the references of record based on the foregoing arguments pertaining to claims 1, 2, 6, 7, 11, and 12, and based on the merit of the additional features set forth in the new claims.

Conclusion:

Applicant respectfully suggests that as presently amended, all of the pending claims are in condition for allowance.

It is applicant's contention that no possible reading of the references, either singly or in any reasonable combination, can be viewed as teaching applicant's claimed invention.

For all of the above mentioned reasons, applicant requests reconsideration and withdrawal of the rejection of record, and allowance of the pending claims.

Favorable reconsideration is respectfully requested.

Respectfully submitted,

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I hereby certify that this correspondence is being electronically transmitted, via EFS-Web, to the United States Patent and Trademark Office, on October 09, 2008.

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Enclosure